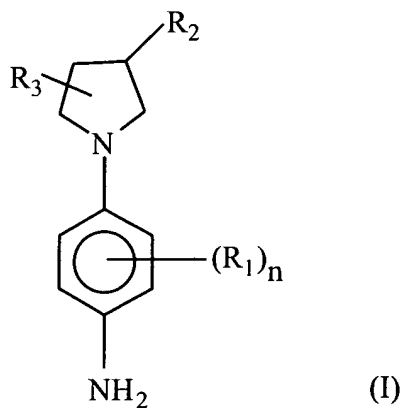


I. AMENDMENT

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) Dye composition for dyeing keratin fibres, comprising, in a medium that is suitable for dyeing, at least one cationic tertiary para-phenylenediamine containing a pyrrolidine nucleus and at least one vitamin derivative chosen from tocopherols and esters thereof, B vitamins and provitamins of B vitamins, and vitamin F, wherein said cationic tertiary paraphenylenediamine containing a pyrrolidine ring corresponds to formula I:



in which

n varies from 0 to 4, it being understood that when n is greater than or equal to 2, then the radicals R_1 may be identical or different,

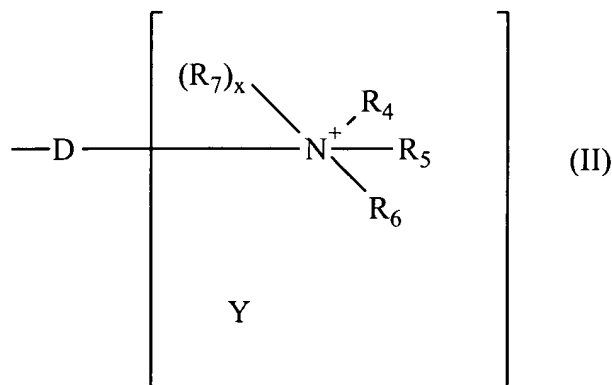
R_1 represents a halogen atom; a saturated or unsaturated, aliphatic or alicyclic, C_1 - C_6 hydrocarbon chain, it being possible for the chain to contain one or more oxygen, nitrogen, silicon or sulphur atoms or an SO_2 group, and it being possible for the chain to be substituted

with one or more hydroxyl or amino radicals; an onium radical Z, the radical R₁ not containing a peroxide bond, or diazo, nitro or nitroso radicals,

R₂ represents an onium radical Z or a radical -X-C=NR₈-NR₉R₁₀ in which X represents an oxygen atom or a radical -NR₁₁ and R₈, R₉, R₁₀ and R₁₁ represent a hydrogen atom, a C₁-C₄ alkyl radical or a C₁-C₄ hydroxyalkyl radical,

R₃ represents a hydrogen atom or a hydroxyl radical.

2. (Canceled)
3. (Currently amended) The composition of claim [[2]] 1, wherein the cationic tertiary para-phenylenediamine is such that n is equal to 0.
4. (Currently amended) The composition of claim [[2]] 1, wherein the cationic tertiary para-phenylenediamine is such that n is equal to 1 and R₁ is chosen from the group formed by a halogen atom; a C₁-C₆ aliphatic or alicyclic, saturated or unsaturated hydrocarbon-based chain; one or more carbon atoms possibly being replaced with an oxygen, nitrogen, silicon or sulphur atom or with an SO₂ group, the radical R₁ not comprising a peroxide bond or diazo, nitro or nitroso radicals.
5. (Currently amended) The composition of claim [[2]] 1, wherein the cationic tertiary para-phenylenediamine is such that R₁ is chosen from chlorine, bromine and C₁-C₄ alkyl, C₁-C₄ hydroxyalkyl, C₁-C₄ aminoalkyl, C₁-C₄ alkoxy or C₁-C₄ hydroxyalkoxy radicals.
6. (Original) The composition of claim 5, wherein the cationic tertiary para-phenylenediamine is such that R₁ is chosen from a methyl, hydroxymethyl, 2-hydroxyethyl, 1,2-dihydroxyethyl, methoxy, isopropoxy or 2-hydroxyethoxy radical.
7. (Currently amended) The composition of claim [[2]] 1, wherein the cationic tertiary para-phenylenediamine is such that R₂ represents the onium radical Z corresponding to formula (II)



in which

D is a single bond or a linear or branched C₁-C₁₄ alkylene chain which may contain one or more hetero atoms chosen from oxygen, sulphur and nitrogen, and which may be substituted with one or more hydroxyl, C₁-C₆ alkoxy or amino radicals, and which may bear one or more ketone functions;

R₄, R₅ and R₆, taken separately, represent a C₁-C₁₅ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; a (C₁-C₆)alkoxy-(C₁-C₆)alkyl radical; an aryl radical; a benzyl radical; a C₁-C₆ amidoalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a C₁-C₆ aminoalkyl radical; a C₁-C₆ aminoalkyl radical in which the amine is mono- or disubstituted with a C₁-C₄ alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; or

R₄, R₅ and R₆ together, in pairs, form, with the nitrogen atom to which they are attached, a saturated 4-, 5-, 6- or 7-membered carbon-based ring optionally containing one or more hetero atoms, the cationic ring possibly being substituted with a halogen atom, a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a carboxyl radical, a (C₁-C₆)alkylcarbonyl radical, a thio (-SH) radical, a C₁-C₆ thioalkyl (-R-SH) radical, a (C₁-C₆)alkylthio radical, an amino radical, an amino radical mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical;

R₇ represents a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; an aryl radical; a benzyl radical; a C₁-C₆ aminoalkyl

radical; a C₁-C₆ aminoalkyl radical in which the amine is mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carboxyalkyl radical; a C₁-C₆ carbamylalkyl radical; a C₁-C₆ trifluoroalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a C₁-C₆ sulphonamidoalkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphinyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphonyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylsulphonamido(C₁-C₆)alkyl radical;

x is 0 or 1,

when x = 0, then the linker arm is attached to the nitrogen atom bearing the radicals R₄ to R₆,

when x = 1, then two of the radicals R₄ to R₆ form, together with the nitrogen atom to which they are attached, a 4-, 5-, 6- or 7-membered saturated ring and D is linked to a carbon atom of the saturated ring;

Y is a counterion.

8. (Original) The composition of claim 7, wherein the cationic tertiary para-phenylenediamine is such that R₂ corresponds to formula II in which x is equal to 0 and R₄, R₅ and R₆, separately, are preferably chosen from a C₁-C₆ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, a C₂-C₄ polyhydroxyalkyl radical, a (C₁-C₆)alkoxy(C₁-C₄)alkyl radical, a C₁-C₆ amidoalkyl radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, or R₄ and R₅ together form an azetidine, pyrrolidine, piperidine, piperazine or morpholine ring, R₆ being chosen in this case from a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; a C₁-C₆ aminoalkyl radical, an aminoalkyl radical mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carbamylalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical.

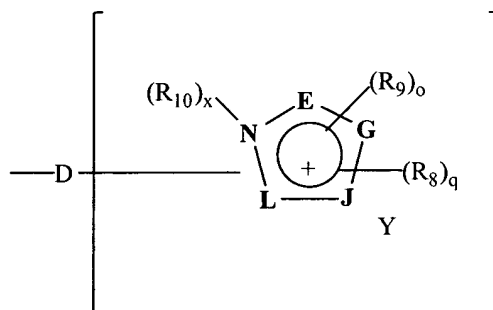
9. (Original) The composition of claim 7, wherein the cationic tertiary para-phenylenediamine is such that R₂ corresponds to formula II in which x is equal to 1 and R₇ is chosen from a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl

radical; a C₁-C₆ aminoalkyl radical; a C₁-C₆ aminoalkyl radical in which the amine is mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carbamylalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical; R₄ and R₅ together form an azetidine, pyrrolidine, piperidine, piperazine or morpholine ring, R₆ being chosen in this case from a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; a C₁-C₆ aminoalkyl radical, a C₁-C₆ aminoalkyl radical in which the amine is mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carbamylalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical.

10. (Original) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine is such that D is a single bond or an alkylene chain that may be substituted.

11. (Original) The composition of claim 7, wherein the cationic tertiary para-phenylenediamine is such that R₂ is a trialkylammonium radical.

12. (Currently amended) The composition of claim [[2]] 1, wherein the cationic tertiary para-phenylenediamine is such that R₂ represents the onium radical Z corresponding to formula (III)



(III)

in which

D is a single bond or a linear or branched C₁-C₁₄ alkylene chain that may contain one or more hetero atoms chosen from oxygen, sulphur and nitrogen, and that may be

substituted with one or more hydroxyl, C₁-C₆ alkoxy or amino radicals, and that may bear one or more ketone functions;

the ring members E, G, J and L, which may be identical or different, represent a carbon, oxygen, sulphur or nitrogen atom to form a pyrrole, pyrazole, imidazole, triazole, oxazole, isoxazole, thiazole or isothiazole ring,

q is an integer between 0 and 4 inclusive;

o is an integer between 0 and 3 inclusive;

q+o is an integer between 0 and 4;

the radicals R₈, which may be identical or different, represent a halogen atom, a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a carboxyl radical, a C₁-C₆ alkylcarbonyl radical, a thio radical, a C₁-C₆ thioalkyl radical, a (C₁-C₆)alkylthio radical, an amino radical, an amino radical mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ monohydroxyalkyl radical or a C₂-C₆ polyhydroxyalkyl radical; it being understood that the radicals R₈ are borne by a carbon atom,

the radicals R₉, which may be identical or different, represent a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, a (C₁-C₆)alkoxy(C₁-C₆)alkyl radical, a C₁-C₆ carbamylalkyl radical, a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical or a benzyl radical; it being understood that the radicals R₉ are borne by a nitrogen atom,

R₁₀ represents a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; an aryl radical; a benzyl radical; a C₁-C₆ aminoalkyl radical, a C₁-C₆ aminoalkyl radical in which the amine is substituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carboxyalkyl radical; a C₁-C₆ carbamylalkyl radical; a C₁-C₆ trifluoroalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a C₁-C₆ sulphonamidoalkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphinyl(C₁-

C₆)alkyl radical; a (C₁-C₆)alkylsulphonyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkyl-carbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylsulphonamido(C₁-C₆)alkyl radical;

x is 0 or 1

when x = 0, the linker arm D is attached to the nitrogen atom,

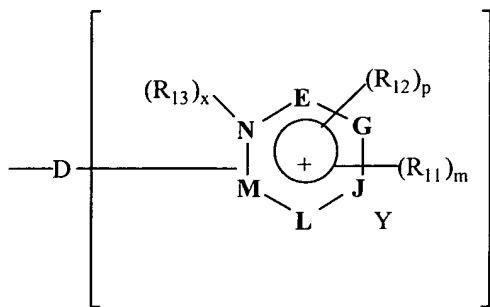
when x = 1, the linker arm D is attached to one of the ring members E, G, J or L,

Y is a counterion.

13. (Original) The composition of claim 12, wherein the cationic tertiary para-phenylenediamine is such that the ring members E, G, J and L form an imidazole ring.

14. (Original) The composition of claim 12, wherein the cationic tertiary para-phenylenediamine is such that x is equal to 0 and D is a single bond or an alkylene chain that may be substituted.

15. (Original) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine is such that R₂ represents an onium radical Z corresponding to formula (IV)



(IV)

in which:

D is a single bond or a linear or branched C₁-C₁₄ alkylene chain which may contain one or more hetero atoms chosen from an oxygen, sulphur or nitrogen atom, and

which may be substituted with one or more hydroxyl, C₁-C₆ alkoxy or amino radicals, and which may bear one or more ketone functions;

the ring members E, G, J, L and M, which may be identical or different, represent a carbon, oxygen, sulphur or nitrogen atom and form a ring chosen from pyridine, pyrimidine, pyrazine, triazine and pyridazine rings;

p is an integer between 0 and 3 inclusive;

m is an integer between 0 and 5 inclusive;

p+m is an integer between 0 and 5;

the radicals R₁₁, which may be identical or different, represent a halogen atom, a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a carboxyl radical, a C₁-C₆ alkylcarbonyl radical, a thio radical, a C₁-C₆ thioalkyl radical, a (C₁-C₆)alkylthio radical, an amino radical, an amino radical substituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ monohydroxyalkyl radical or a C₂-C₆ polyhydroxyalkyl radical; it being understood that the radicals R₁₁ are borne by a carbon atom,

the radicals R₁₂, which may be identical or different, represent a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, a (C₁-C₆)alkoxy(C₁-C₆)alkyl radical, a C₁-C₆ carbamylalkyl radical, a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical or a benzyl radical; it being understood that the radicals R₁₂ are borne by a nitrogen atom,

R₁₃ represents a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; an aryl radical; a benzyl radical; a C₁-C₆ aminoalkyl radical; a C₁-C₆ aminoalkyl radical in which the amine is mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carboxyalkyl radical; a C₁-C₆ carbamylalkyl radical; a C₁-C₆ trifluoroalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a C₁-C₆ sulphonamidoalkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)-

alkylsulphinyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphonyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylsulphonamido(C₁-C₆)alkyl radical;

x is 0 or 1

when x = 0, the linker arm D is attached to the nitrogen atom,

when x = 1, the linker arm D is attached to one of the ring members E, G, J, L or M,

Y is a counterion.

16. (Original) The composition of claim 15, wherein the ring members E, G, J, L and M form with the ring nitrogen a ring chosen from pyridine and pyrimidine rings.

17. (Original) The composition of claim 15, wherein the cationic tertiary para-phenylenediamine is such that x is equal to 0 and R₁₁ is chosen from a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a C₁-C₆ alkylcarbonyl radical, an amino radical, an amino radical mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ monohydroxyalkyl radical or a C₂-C₆ polyhydroxyalkyl radical, and R₁₂ is chosen from a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, a (C₁-C₆)alkoxy(C₁-C₆)alkyl radical or a C₁-C₆ carbamylalkyl radical.

18. (Original) The composition of claim 15, wherein the cationic tertiary para-phenylenediamine is such that x is equal to 1 and R₁₃ is chosen from a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; a C₁-C₆ aminoalkyl radical, a C₁-C₆ aminoalkyl radical in which the amine is mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carbamylalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical; R₁₁ is chosen from a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy

radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a C₁-C₆ alkylcarbonyl radical, an amino radical, an amino radical mono- or disubstituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; and R₁₂ is chosen from a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, a (C₁-C₆)alkoxy(C₁-C₆)alkyl radical and a C₁-C₆ carbamylalkyl radical.

19. (Original) The composition of claim 15, wherein the cationic tertiary para-phenylenediamine is such that R₁₁, R₁₂ and R₁₃ are alkyl radicals that may be substituted.

20. (Currently amended) The composition of claim [[2]] 1, wherein the cationic tertiary para-phenylenediamine is such that the radical R₂ is a radical of formula -XP(O)(O-)OCH₂CH₂N⁺(CH₃)₃ in which X represents an oxygen atom or a radical -NR₁₄, R₁₄ representing a hydrogen, a C₁-C₄ alkyl radical or a hydroxyalkyl radical.

21. (Original) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine is such that the radical R₂ is a guanidine radical of formula -X-C=NR₈-NR₉R₁₀, X represents an oxygen atom or a radical -NR₁₁, R₈, R₉, R₁₀ and R₁₁ representing a hydrogen, a C₁-C₄ alkyl radical or a hydroxyalkyl radical.

22. (Original) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine is chosen from the group formed by:

[1-(4-Aminophenyl)pyrrolidin-3-yl]trimethylammonium chloride;

[1-(4-Aminophenyl)pyrrolidin-3-yl]dimethyltetradecylammonium bromide;

N'-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N,N-dimethylguanidine;

N-[1-(4-Aminophenyl)pyrrolidin-3-yl]guanidine;

3-[1-(4-Aminophenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride;

[1-(4-Aminophenyl)pyrrolidin-3-yl](2-hydroxyethyl)dimethyl ammonium chloride;

[1-(4-Aminophenyl)pyrrolidin-3-yl]dimethyl(3-trimethylsilylpropyl)ammonium chloride;

[1-(4-Aminophenyl)pyrrolidin-3-yl](trimethylammonium hexyl)dimethylammonium dichloride

[1-(4-Aminophenyl)pyrrolidin-3-yl]oxophosphorylcholine

{2-[1-(4-Aminophenyl)pyrrolidin-3-yloxy]ethyl}-trimethylammonium chloride

1-{2-[1-(4-Aminophenyl)pyrrolidin-3-yloxy]ethyl}-1-methylpyrrolidinium chloride

3-{3-[1-(4-Aminophenyl)pyrrolidin-3-yloxy]propyl}-1-methyl-3H-imidazol-1-ium chloride

1-{2-[1-(4-Aminophenyl)pyrrolidin-3-yloxy]ethyl}-1-methylpiperidinium chloride

3-{3-[1-(5-Trimethylsilanylethyl-4-amino-3-trimethylsilanylethylphenyl)pyrrolidin-3-yloxy]propyl}-1-methyl-3H-imidazol-1-ium chloride

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]trimethylammonium chloride;

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]dimethyltetradecylammonium chloride;

N'-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]-N,N-dimethylguanidine;

N-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]guanidine;

3-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride;

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl](2-hydroxyethyl)dimethylammonium chloride;

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]dimethyl(3-trimethylsilylpropyl)ammonium chloride;

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl](trimethylammoniumhexyl)dimethylammonium dichloride

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]oxophosphorylcholine

{2-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yloxy]ethyl}-trimethylammonium chloride

1-{2-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yloxy]ethyl}-1-methyl-pyrrolidinium chloride

3-{3-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yloxy]propyl}-1-methyl-3H-imidazol-1-ium chloride

1-{2-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yloxy]ethyl}-1-methylpiperidinium chloride

[1-(4-Amino-3-trimethylsilanylethylphenyl)pyrrolidin-3-yl]-trimethylammonium chloride

3-[1-(4-Amino-3-trimethylsilanylethylphenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride

3-{3-[1-(4-Amino-3-trimethylsilanylethylphenyl)pyrrolidin-3-yloxy]propyl}-1-methyl-3H-imidazol-1-ium chloride

[1-(5-Trimethylsilanylethyl-4-amino-3-trimethylsilanylethylphenyl)pyrrolidin-3-yl]trimethylammonium chloride

3-[1-(5-trimethylsilanylethyl-4-Amino-3-trimethylsilanylethylphenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride

1'-(4-Aminophenyl)-1-methyl[1,3']bipyrrolidinyl-1-ium chloride;

1'-(4-Amino-3-methylphenyl)-1-methyl[1,3']bipyrrolidinyl-1-ium chloride;

3-{[1-(4-Aminophenyl)pyrrolidin-3-ylcarbamoyl]methyl}-1-methyl-3H-imidazol-1-ium chloride;

3-{[1-(4-Aminophenyl)pyrrolidin-3-ylcarbamoyl]methyl}-1-methyl-3H-imidazol-1-ium chloride;

3-[1-(4-Aminophenyl)pyrrolidin-3-yl]-1-(3-trimethylsilanylpropyl)-3H-imidazol-1-ium chloride;

3-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]-1-(3-trimethylsilanylpropyl)-3H-imidazol-1-ium chloride;

[1-(4-Aminophenyl)pyrrolidin-3-yl]ethyl dimethylammonium chloride;

[1-(4-Aminophenyl)pyrrolidin-3-yl]ethyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyltrimethylammonium bromide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyltrimethylammonium methosulphate;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]butyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]pentyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hexyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]heptyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]octyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]decyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hexadecyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hydroxyethyltrimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hydroxyethyltrimethylammonium iodide.

23. (Original) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine is chosen from the group formed by:

[1-(4-Aminophenyl)pyrrolidin-3-yl]trimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]dimethyltetradecylammonium bromide;
 N'-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N,N-dimethylguanidine;
 N-[1-(4-Aminophenyl)pyrrolidin-3-yl]guanidine;
 3-[1-(4-Aminophenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl](2-hydroxyethyl)dimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]dimethyl(3-trimethylsilylpropyl)ammonium chloride;
 [1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]trimethylammonium chloride

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]dimethyltetra decylammonium chloride;
 N'-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]-N,N-dimethylguanidine;
 N-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]guanidine;
 3-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride;
 [1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl](2-hydroxyethyl)
 dimethylammoniumchloride;
 [1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]dimethyl(3-
 trimethylsilanylpropylammonium chloride;
 1'-(4-Aminophenyl)-1-methyl[1,3']bipyrrolidinyl-1-ium chloride;
 1'-(4-Amino-3-methylphenyl)-1-methyl[1,3']bipyrrolidinyl-1-ium chloride;
 3-{[1-(4-Aminophenyl)pyrrolidin-3-ylcarbamoyl]methyl}-1-methyl-3H-imidazol-1-ium
 chloride;
 3-{[1-(4-Amino-3-methylphenyl)pyrrolidin-3-ylcarbamoyl]methyl}-1-methyl-3H-
 imidazol-1-ium chloride;
 3-[1-(4-Aminophenyl)pyrrolidin-3-yl]-1-(3-trimethylsilanylpropyl)-3H-imidazol-1-ium
 chloride;
 3-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]-1-(3-trimethylsilanylpropyl)-3H-
 imidazol-1-ium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]ethyl dimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]ethyl dimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyl dimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyl dimethylammonium bromide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyl dimethylammonium methosulphate;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]butyl dimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]pentyl dimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hexyl dimethylammonium iodide;

[1-(4-Aminophenyl)pyrrolidin-3-yl]heptyldimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]octyldimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]decyldimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hexadecyldimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hydroxyethyl dimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hydroxyethyl dimethylammonium iodide.

24. (Original) The composition of claim 1, wherein the the cationic tertiary para-phenylenediamine is chosen from the group formed by:

[1-(4-Aminophenyl)pyrrolidin-3-yl]trimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]dimethyltetradecylammonium bromide;
 N'-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N,N-dimethylguanidine;
 N-[1-(4-Aminophenyl)pyrrolidin-3-yl]guanidine;
 3-[1-(4-Aminophenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl](2-hydroxyethyl)dimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]dimethyl(3-trimethylsilylpropyl)ammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl](trimethylammonium-hexyl)dimethylammonium dichloride;
 1'-(4-Aminophenyl)-1-methyl[1,3']bipyrrolidinyl-1-ium chloride
 3-[1-(4-Aminophenyl)pyrrolidin-3-yl]-1-(3-trimethylsilylpropyl)-3H-imidazol-1-ium chloride;
 3-[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]-1-(3-trimethylsilylpropyl)-3H-imidazol-1-ium chloride;
 [1-(4-aminophenyl)pyrrolidin-3-yl]ethyl dimethylammonium chloride;

[1-(4-Aminophenyl)pyrrolidin-3-yl]ethyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyltrimethylammonium bromide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]propyltrimethylammonium methosulphate;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]butyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]pentyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hexyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]heptyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]octyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]decyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hexadecyltrimethylammonium iodide;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hydroxyethyltrimethylammonium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl]hydroxyethyltrimethylammonium iodide.

25. (Original) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine is chosen from the group formed by:

[1-(4-Aminophenyl)pyrrolidin-3-yl]trimethylammonium chloride;
 3-[1-(4-Aminophenyl)pyrrolidin-3-yl]-1-methyl-3H-imidazol-1-ium chloride;
 [1-(4-Aminophenyl)pyrrolidin-3-yl](2-hydroxyethyl)dimethylammonium chloride;
 1'-(4-Aminophenyl)-1-methyl[1,3']bipyrrolidinyl-1-ium chloride.

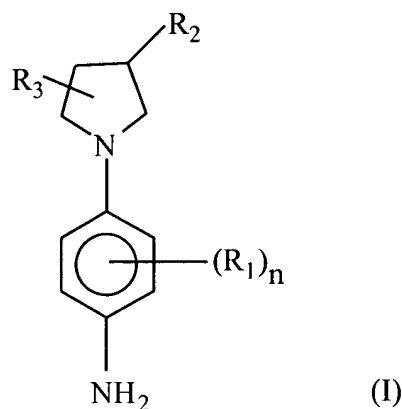
26. (Original) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine is chosen from the group formed by:

[1-(4-Aminophenyl)pyrrolidin-3-yl]trimethylammonium chloride and
 [1-(4-Aminophenyl)pyrrolidin-3-yl](2-hydroxyethyl)dimethyl ammonium chloride.

27. (Original) The composition of claim 1, wherein the vitamin derivative is chosen from α -tocopherol and its esters, β -tocopherol, γ -tocopherol, δ -tocopherol, ϵ -tocopherol, ζ_1 -tocopherol, ζ_2 -tocopherol and η -tocopherol.
28. (Original) The composition of claim 27, wherein the vitamin derivative is vitamin E.
29. (Original) The composition of claim 27, wherein the vitamin derivative is chosen from vitamin E acetate and vitamin E palmitate.
30. (Original) The composition of claim 1, wherein the vitamin derivative is chosen from pantothenic acid, niacinamide, nicotinic acid, inositol, biotin, thiamine, riboflavin, pyridoxine, carnitine and folic acid.
31. (Original) The composition of claim 30, wherein the vitamin derivative is pantothenic acid.
32. (Original) The composition of claim 1, wherein the vitamin derivative is pantothenol.
33. (Currently amended) The composition of claim 1, wherein the cationic tertiary para-phenylenediamine(s) containing a pyrrolidine nucleus represent(s) from 0.001% to 10% ~~and preferably from 0.005% to 6%~~ by weight relative to the total weight of the composition.
34. (Original) The composition of claim 1, wherein the vitamin derivative(s) represent(s) from 0.0001% to 10%.
35. (Original) The composition of claim 34, wherein the vitamin derivative(s) represent(s) from 0.01% to 2% by weight relative to the total weight of the composition.
36. (Original) The composition of claim 1, wherein the composition further comprises at least one cationic polymer.
37. (Original) The composition of claim 1, wherein the composition further comprises at least one thickening polymer.

38. (Original) The composition of claim 1, wherein the composition further comprises at least one surfactant chosen from the group formed by anionic surfactants, amphoteric or zwitterionic surfactants, nonionic surfactants and cationic surfactants.
39. (Original) The composition of claim 1, wherein the composition further comprises at least one additional oxidation base other than cationic tertiary para-phenylenediamines containing a pyrrolidine nucleus, chosen from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols and heterocyclic bases, and the addition salts thereof.
40. (Original) The composition of claim 39, wherein the additional oxidation base(s) is (are) present in an amount of between 0.001% and 20% by weight relative to the total weight of the composition.
41. (Original) The composition of claim 1, wherein the composition further comprises at least one coupler chosen from meta-phenylenediamines, meta-aminophenols, meta-diphenols, naphthalene-based couplers and heterocyclic couplers, and the addition salts thereof.
42. (Original) The composition of claim 41, wherein the coupler is chosen from 1,3-dihydroxybenzene, 1,3-dihydroxy-2-methylbenzene, 4-chloro-1,3-dihydroxybenzene, 2,4-diamino-1-(β -hydroxyethyloxy)benzene, 2-amino-4-(β -hydroxyethylamino)-1-methoxybenzene, 1,3-diaminobenzene, 1,3-bis(2,4-diaminophenoxy)propane, 3-ureidoaniline, 3-ureido-1-dimethylaminobenzene, sesamol, 1- β -hydroxyethylamino-3,4-methylenedioxybenzene, α -naphthol, 2-methyl-1-naphthol, 6-hydroxyindole, 4-hydroxyindole, 4-hydroxy-N-methylindole, 2-amino-3-hydroxypyridine, 6-hydroxybenzomorpholine, 3,5-diamino-2,6-dimethoxypyridine, 1-N-(β -hydroxyethyl)amino-3,4-methylenedioxybenzene and 2,6-bis(β -hydroxyethylamino)toluene, and the addition salts thereof.
43. (Currently amended) The composition of claim 41, wherein the coupler(s) is (are) present in an amount of between 0.001% and 20% ~~and preferably between 0.005% and 6%~~ by weight relative to the total weight of the composition.

44. (Original) The composition of claim 1, wherein the composition further comprises at least one direct dye.
45. (Original) The composition of claim 1, wherein the composition further comprises at least one hydroxylated solvent such as ethanol, propylene glycol, glycerol and polyol monoethers.
46. (Original) The composition of claim 1, wherein the composition further comprises an oxidizing agent chosen from hydrogen peroxide, urea peroxide, alkali metal bromates, persalts, peracids and oxydase enzymes, and preferably hydrogen peroxide.
47. (Original) A process for the oxidation dyeing of keratin fibres, wherein a dye composition as defined in claim 1 is applied to fibres in the presence of an oxidizing agent.
48. (Original) A multi-compartment device, in which a first compartment comprises a dye composition for dyeing keratin fibres, as defined in claim 1, and a second compartment comprises an oxidizing agent.
49. (New) Dye composition for dyeing keratin fibres, comprising, in a medium that is suitable for dyeing, at least one cationic tertiary para-phenylenediamine containing a pyrrolidine nucleus and at least one vitamin derivative chosen from tocopherols and esters thereof, B vitamins and provitamins of B vitamins, and vitamin F, wherein said cationic tertiary paraphenylenediamine containing a pyrrolidine ring corresponds to formula I:



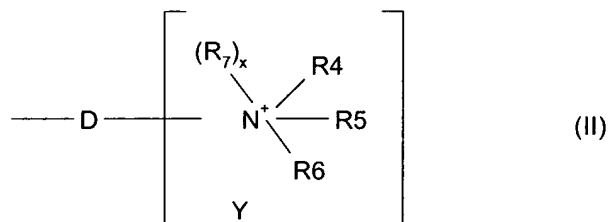
in which

n varies from 0 to 4, it being understood that when n is greater than or equal to 2, then the radicals R_1 may be identical or different,

R_1 represents a halogen atom; a saturated or unsaturated, aliphatic or alicyclic, C_1 - C_6 hydrocarbon chain, it being possible for the chain to contain one or more oxygen, nitrogen, silicon or sulphur atoms or an SO_2 group, and it being possible for the chain to be substituted with one or more hydroxyl or amino radicals; an onium radical Z, the radical R_1 not containing a peroxide bond, or diazo, nitro or nitroso radicals,

R_3 represents a hydrogen atom or a hydroxyl radical,

R_2 represents an onium radical Z selected from formula (II), formula (III) or formula (IV), wherein formula (II) corresponds to:



in which

D is a single bond of a linear or branched C_1 - C_{14} alkylene chain which may contain one or more heteroatoms chosen from oxygen, sulphur or nitrogen, and which may be substituted with one or more hydroxyl, C_1 - C_6 alkoxy or amino radicals and which may carry one or more ketone functional groups;

R_4 , R_5 and R_6 , taken separately, represent a C_1 - C_{15} alkyl radical; a C_1 - C_6 monohydroxyalkyl radical; a C_2 - C_6 polyhydroxyalkyl radical; a (C_1 - C_6)alkoxy(C_1 - C_6)alkyl radical; an aryl radical; a benzyl radical; a C_1 - C_6 amidoalkyl radical; a tri(C_1 - C_6)alkylsilane(C_1 - C_6)alkyl radical; a C_1 - C_6 aminoalkyl radical; a C_1 - C_6 aminoalkyl radical in which the amine is mono- or di-substituted with a C_1 - C_4 alkyl, (C_1 - C_6)alkylcarbonyl, amido or (C_1 - C_6)alkylsulphonyl radical; or

R₄, R₅ and R₆ together, in pairs, form, with the nitrogen atom to which they are attached, a 4-, 5-, 6- or 7-membered saturated carbon ring which may contain one or more heteroatoms, it being possible for the cationic ring to be substituted with a halogen atom, a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a carboxyl radical, a (C₁-C₆)alkylcarbonyl radical, a thio (-SH) radical, a C₁-C₆ thioalkyl (-R-SH) radical, a (C₁-C₆)alkylthio radical, an amino radical, an amino radical which is mono- or di-substituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical;

R₇ represents a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; an aryl radical; a benzyl radical; a C₁-C₆ aminoalkyl radical; a C₁-C₆ aminoalkyl radical whose amine is mono- or di-substituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carboxyalkyl radical; a C₁-C₆ carbamylalkyl radical; a C₁-C₆ trifluoroalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a C₁-C₆ sulphonamidoalkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphinyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphonyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylsulphonamido(C₁-C₆)alkyl radical;

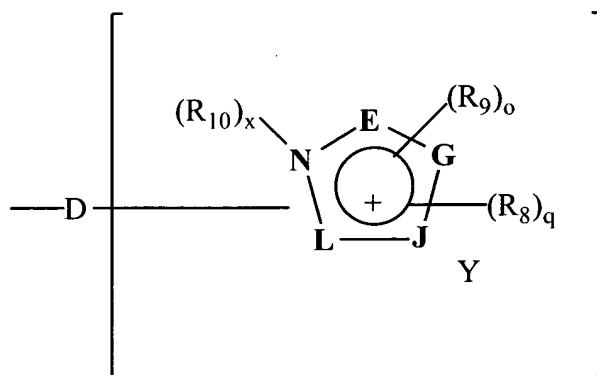
x is 0 or 1,

when x = 0, then the linking arm is attached to the nitrogen atom carrying the radicals R₄ to R₆; with the proviso that when the linking arm D is a covalent bond then R₄ is chosen from or an aryl radical; a benzyl radical; a C₁-C₆ amidoalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a C₁-C₆ aminoalkyl radical; a C₁-C₆ aminoalkyl radical in which the amine is mono- or di-substituted with a C₁-C₄ alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; or;

when x = 1, then two of the radicals R₄ to R₆ form, together with the nitrogen atom to which they are attached, a 4-, 5-, 6- or 7-membered saturated ring and D is linked to the carbon atom of the saturated ring;

Y is a counter-ion;

and formula (III) corresponds to:



(III)

in which

D is a single bond or a linear or branched C₁-C₁₄ alkylene chain which may contain one or more heteroatoms chosen from oxygen, sulphur or nitrogen, and which may be substituted with one or more hydroxyl, C₁-C₆ alkoxy or amino radicals, and which may carry one or more ketone functional groups;

the vertices E, G, J, L, which are identical or different, represent a carbon, oxygen, sulphur or nitrogen atom to form a pyrrole, pyrazole, imidazole, triazole, oxazole, isooxazole, thiazole, isothiazole ring,

q is an integer between 0 and 4 inclusive;

o is an integer between 0 and 3 inclusive;

q+o is an integer between 0 and 4;

the radicals R₈, which are identical or different, represent a halogen atom, a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a carboxyl radical, a C₁-C₆ alkylcarbonyl

radical, a thio radical, a C₁-C₆ thioalkyl radical, a (C₁-C₆)alkylthio radical, an amino radical, an amino radical which is mono- or di-substituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ monohydroxyalkyl radical or a C₂-C₆ polyhydroxyalkyl radical; it being understood that the radicals R₈ are carried by a carbon atom,

the radicals R₉, which are identical or different, represent a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, a (C₁-C₆)alkoxy(C₁-C₆)alkyl radical, a C₁-C₆ carbamylalkyl radical, a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical, a benzyl radical; it being understood that the radicals R₉ are carried by a nitrogen,

R₁₀ represents a C₁-C₆ alkyl radical; a C₁-C₆ monohydroxyalkyl radical; a C₂-C₆ polyhydroxyalkyl radical; an aryl radical; a benzyl radical; a C₁-C₆ aminoalkyl radical, a C₁-C₆ aminoalkyl radical whose amine is substituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ carboxyalkyl radical; a C₁-C₆ carbamylalkyl radical; a C₁-C₆ trifluoroalkyl radical; a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical; a C₁-C₆ sulphonamidoalkyl radical; a (C₁-C₆)alkylcarboxy(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphonyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylsulphonyl(C₁-C₆)alkyl radical; a (C₁-C₆)alkylcarbonyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylcarbamyl(C₁-C₆)alkyl radical; an N-(C₁-C₆)alkylsulphonamido(C₁-C₆)alkyl radical;

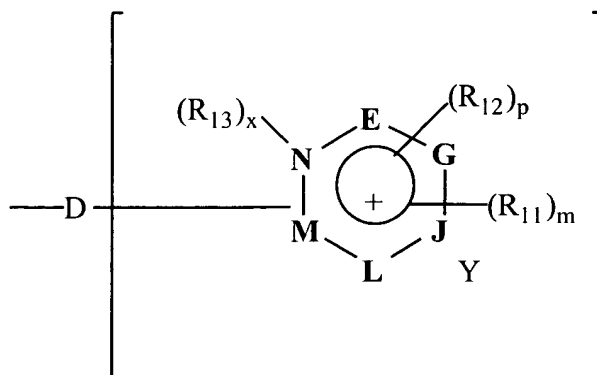
x is 0 or 1

when x = 0, the linking arm D is attached to the nitrogen atom,

when x = 1, the linking arm D is attached to one of the vertices E, G, J or L,

Y is a counter-ion;

and formula (IV) corresponds to:



(IV)

in which:

D is a single bond or a linear or branched C₁-C₁₄ alkylene chain which may contain one or more heteroatoms chosen from an oxygen, sulphur or nitrogen atom, and which may be substituted with one or more hydroxyl, C₁-C₆ alkoxy or amino radicals, and which may carry one or more ketone functional groups;

the vertices E, G, J, L and M, which are identical or different, represent a carbon, oxygen, sulphur or nitrogen atom to form a ring chosen from the pyridine, pyrimidine, pyrazine, triazine and pyridazine rings;

p is an integer between 0 and 3 inclusive;

m is an integer between 0 and 5 inclusive;

p+m is an integer between 0 and 5;

the radicals R₁₁, which are identical or different, represent a halogen atom, a hydroxyl radical, a C₁-C₆ alkyl radical, a C₁-C₆ monohydroxyalkyl radical, a C₂-C₆ polyhydroxyalkyl radical, a C₁-C₆ alkoxy radical, a tri(C₁-C₆)alkylsilane(C₁-C₆)alkyl radical, an amido radical, a carboxyl radical, a C₁-C₆ alkylcarbonyl radical, a thio radical, a C₁-C₆ thioalkyl radical, a (C₁-C₆)alkylthio radical, an amino radical, an amino radical which is substituted with a (C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyl, amido or (C₁-C₆)alkylsulphonyl radical; a C₁-C₆ monohydroxyalkyl radical or a C₂-C₆ polyhydroxyalkyl radical; it being understood that the radicals R₁₁ are carried by a carbon atom,

the radicals R_{12} , which are identical or different, represent a C_1 - C_6 alkyl radical, a C_1 - C_6 monohydroxyalkyl radical, a C_2 - C_6 polyhydroxyalkyl radical, a tri(C_1 - C_6)alkylsilane(C_1 - C_6)alkyl radical, a (C_1 - C_6)alkoxy(C_1 - C_6)alkyl radical, a C_1 - C_6 carbamylalkyl radical, a (C_1 - C_6)alkylcarboxy(C_1 - C_6)alkyl radical, a benzyl radical; it being understood that the radicals R_{12} are carried by a nitrogen,

R_{13} represents a C_1 - C_6 alkyl radical; a C_1 - C_6 monohydroxyalkyl radical; a C_2 - C_6 polyhydroxyalkyl radical; an aryl radical; a benzyl radical; a C_1 - C_6 aminoalkyl radical, a C_1 - C_6 aminoalkyl radical whose amine is mono- or di-substituted with a (C_1 - C_6)alkyl, (C_1 - C_6)alkylcarbonyl, amido or (C_1 - C_6)alkylsulphonyl radical; a C_1 - C_6 carboxyalkyl radical; a C_1 - C_6 carbamylalkyl radical; a C_1 - C_6 trifluoroalkyl radical; a tri(C_1 - C_6)alkylsilane(C_1 - C_6)alkyl radical; a C_1 - C_6 sulphonamidoalkyl radical; a (C_1 - C_6)alkylcarboxy(C_1 - C_6)alkyl radical; a (C_1 - C_6)alkylsulphinyl(C_1 - C_6)alkyl radical; a (C_1 - C_6)alkylsulphonyl(C_1 - C_6)alkyl radical; a (C_1 - C_6)alkylcarbonyl(C_1 - C_6)alkyl radical; an N-(C_1 - C_6)alkylcarbamyl(C_1 - C_6)alkyl radical; an N-(C_1 - C_6)alkylsulphonamido(C_1 - C_6)alkyl radical;

x is 0 or 1

when $x = 0$, the linking arm D is attached to the nitrogen atom,

when $x = 1$, the linking arm D is attached to one of the vertices E, G, J, L or M,

Y is a counter-ion.